

REMARKS

In response to the official action, presented herewith are amendments to the claims and arguments describing the distinctions of the claimed invention over the cited prior art. Also submitted is a declaration under 37 C.F.R. § 1.132 of the inventor Kelvin Robert Legge describing the long felt need in the art for a solution to the problem of increased temperature on the lifespan and performance of geosynthetic liners, and the unexpected results obtainable by practice of the claimed invention.

The present invention provides a geotechnical barrier and methods of operating the same, which involves providing a negative pressure at an outlet of a passageway with respect to the inlet, thereby displacing a fluid through the passageway under negative pressure. Use of negative pressure and displacement of fluid through the passageway results in one or more advantages, as described in the application. Use of negative pressure can avoid inflation of and damage to the barrier (page 13, lines 3-6), and facilitate removal of volatile organic compounds which may diffuse through the layers (page 13, lines 24-32). Movement of the fluid through the passageway can cool the surrounding barrier components (page 11, lines 16-27; page 13, lines 6-24), hydrate barrier components (page 10, lines 27-32; page 11, lines 29-31; page 12, line 33, to page 13, line 3), remove contaminants such as volatile organic compounds or toxic fluids (page 12, lines 6-11; page 13, lines 24-32), and allow for monitoring and detection of leaks in the barrier (page 12, lines 13-16). Significantly, as described at page 13, lines 15-21, the lifespan of a geomembrane can be extended by practice of the invention:

. . . in landfills in which decomposition is taking place, temperatures in the waste mass of the order of 60 °C are readily achieved. Generally, the higher the temperature to which a geomembrane is exposed, the faster it will degrade. Thus, by maintaining or regularly reducing the temperature to which the overlying and underlying geomembranes 18, 26 are exposed by introducing cool air throughout the life of the waste site (while decomposing) the lifespans of the geomembranes will be extended.

The prior art cited in the official action is either (a) directed to a completely different area of technology, and bears little resemblance to the claimed invention or (b) discloses some aspects in common with the claimed invention, but only as peripheral features or ones used only under exceptional circumstances, such as when in a failure state.

With those advantages and distinctions in mind, the claims have been amended as described below.

Brief Summary of the Amendments

Claims 15 to 28 are canceled without prejudice.

Claim 44 is amended to state that at least one of the barrier layers is a geosynthetic barrier and to include the feature of providing a regular negative pressure at the outlet to achieve the regular displacement of a fluid through the fluid passageway from the inlet to the outlet. Parallel amendments are made to claims 59 and 60, and the withdrawn apparatus claims 1 and 29. Similarly, new independent claims 64, 68, and 72 (parallel dependent claims) include the feature of providing substantially continuous or continuous negative pressure at the outlet to achieve displacement of the fluid through the passageway from the inlet to the outlet. Support for the amendments can be found at page 3 line 23, page 10 line 32, page 11, lines 19-31, and page 13 lines 18-22 and line 24-30.

New claim 63 is added to include the feature that both of the barrier layers are geosynthetic barrier layers, as was the case in the original claim 44.

Original claim 46 has been deleted.

Conforming amendments have been made to claims 45, 47, and 48.

Claim Objection

Claim 18 has been canceled, rendering the objection moot.

The 35 U.S.C. § 102(b) Rejections are Moot or Traversed

Claims 15-18, 20, 21, 24, 28, 44-46, 48-51, 53, 54, and 58 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Robertson et al. U.S. Patent No. 4,916,937. See pp. 2-4 of the action. A response to the anticipation rejections is set forth below.

Claims 15-18, 20, 21, 24, 28 and 46 have been canceled, rendering the rejections of those claims moot.

The rejections as to the remaining claims are mooted by the amendments submitted herewith, and to the extent that the rejections would be maintained they are traversed.

Proper Basis for a § 102(b) Rejection

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Thus, an anticipation determination necessarily must involve two analytical steps. First, the claim language must be interpreted, providing the broadest reasonable construction to the various claim terms consistent with the specification. Second, the claims, so construed/interpreted, must be compared to the prior art reference and factual findings must be made that “each and

every limitation is found either expressly or inherently in [that] single prior art reference.” See *Celeritas Techs. Ltd. v. Rockwell Int’l Corp.*, 47 USPQ2d 1516, 1522 (Fed. Cir. 1998). Additionally, “[t]he identical invention must be shown in as complete detail as is contained in the patent claim.” *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

The § 102(b) Rejection Is Traversed

It is respectfully submitted that the claims are not anticipated by the Robertson '937 patent.

Robertson discloses a barrier system in which discrete regions of the barrier may be depressurized. However, it is clear that this depressurized state (or the pressurized alternative state) is a *static* condition. Tellingly, the Robertson invention is described as a "pressure barrier." There is disclosure of a vacuum pump to evacuate the depressurized regions, but having set up the required level of depressurization, or when the pump's capacity limit is reached, the pressure in the relevant region will remain static and there will be no displacement of a fluid through a fluid passageway, unless the relevant barrier region suffers a leak.

Only in the case of a failure of a barrier will there be a displacement of fluid, and the fluid will be displaced is that fluid contained in the barrier lagoon -- not an independent fluid such as an air stream.

Furthermore, there is no "inlet," as recited in the claims, to the depressurized regions in Robertson, unless and until a failure in the barrier occurs. Thus, there will be no regular displacement of fluid through a passageway from an inlet to an outlet.

In addition, where a leak is present in Robertson, the depressurization of the relevant regions will lead to a worsening of the condition if it is applied continuously for any length of time. Instead, column 3, lines 54-57, teaches to repair any leaks ("If the region still fails to maintain the selected pressure . . . then the lowermost membrane is inspected to locate leaks therein which are then repaired"). Contrary to Robertson, the claimed invention requires an inlet as well as an outlet, and regular displacement of fluid through the passageway from the inlet to the outlet.

Claims 15 and 27 were rejected as anticipated by WO 99/01619. Claims 15 and 27 have been canceled, rendering the rejections moot.

Claims 44, 57, and 59 were rejected as anticipated by Cunningham U.S. Patent No. 4,462,184 (the '184 patent).

Cunningham deals with an entirely different field of application, namely a sports field or running track. The claims of the present invention recite barrier layers and not simply synthetic layers. While reference (333) in Cunningham is indeed described as a membrane and may be impermeable (although this is not stated), the second "synthetic surface" referred to in the passage quoted in the official action (column 15, lines 34-36) is not a barrier. Both the synthetic surface and the other layers (335, 337) are permeable and meant to allow drainage and even evaporation therethrough, otherwise the drainage system of the invention would not work and water would accumulate in puddles on the synthetic surface (see, for example, column 13, lines 36 to 53 and column 14, lines 27 to 41).

Furthermore, Cunningham '184 does not disclose fluid displacement under negative pressure from an inlet to an outlet, as claimed. Instead, Cunningham '184 discloses flushing out of the dead grass and its root system through the synthetic, non-barrier layer and to a drainage system. There is no provision of a negative pressure, and no displacement from an inlet (other than the synthetic, non-barrier layer) to an outlet.

In view of the foregoing, it should be clear that the prior art does not anticipate the claims because several claim elements are not found in the prior art. Accordingly, the claims are in compliance with § 102 and the rejections can be withdrawn. Reconsideration is respectfully requested.

The 35 U.S.C. § 103(a) Rejections are Moot or Traversed

Claims 19 and 52 have been rejected under 35 U.S.C. § 103(a) as being obvious over the Robertson '937 patent in view of Bohnhoff U.S. Patent No. 5,848,856. See p. 5 of the action.

Claim 19 has been canceled, rendering the rejection moot.

Claim 52, which depends indirectly from claim 44, is patentable for the same reasons provided above with respect to Robertson '937 and claim 44.

Claims 22, 23, 47, and 60 have been rejected under 35 U.S.C. § 103(a) as being obvious over the Robertson '937 patent in view of McGroarty et al. U.S. Patent No. 5,091,234. See pp. 5-6 of the action.

Claims 22 and 23 have been canceled, rendering the rejections moot.

Claim 47, which depends indirectly from claim 44, is patentable for the same reasons provided above with respect to Robertson '937 and claim 44.

Claim 60 has been amended to recite a method wherein the barrier layers have a passageway having an inlet and an outlet, the method including providing, regularly, a

negative pressure at the outlet with respect to the inlet, thereby displacing, regularly, a hydrating fluid through the fluid passageway. Accordingly the amendment renders the rejection moot for the same reasons provided above with respect to claim 44 and the parallel claim elements.

Declaration Under 37 C.F.R. § 1.132

Submitted herewith is a declaration of the inventor Kelvin Robert Legge under 37 C.F.R. § 1.132 addressing the long-felt need in the art for a solution to the deleterious effects of increased temperature on the lifespan and performance of geosynthetic liners, and the unexpected results achieved by practice of the claimed invention, particularly in level of hydration of clay liners and extent of the reduction of temperatures in geosynthetic liners.

Election/Restriction

The fluid displacement means in both the apparatus and method claims is qualified by the feature of regularly providing a negative pressure at the outlet. It is submitted that a barrier and method having such regular fluid displacement is indeed not part of the prior art and, accordingly, such a fluid displacement can indeed qualify as a special technical feature as envisaged by PCT Rule 13.2. In view of the further explanation provided above, reconsideration and withdrawal of the restriction requirement, and rejoinder of the restricted apparatus claims, are respectfully requested.

CONCLUSION

In view of the foregoing, entry of the amendments to the claims, withdrawal of the rejections and objection, and allowance of all pending claims are respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form or procedure in an effort to advance this application to allowance, the examiner is urged to telephone the undersigned attorney at the indicated number.

Respectfully submitted,
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